

HELICONIA IN NICARAGUA

Robert R. Smith
Hartwick College, Oneonta, N.Y.

The flora of Nicaragua is presently being studied by Mr. Frank C. Seymour of The Herbarium, University of Florida. Mr. Seymour and companions have made six expeditions to Nicaragua between 1968 and 1975. Several collections of Heliconia were made on these expeditions. With the encouragement of Mr. Seymour, the author, utilizing the Seymour collection and information accumulated in a thesis on the genus Heliconia of Middle America, decided to contribute to the flora of Nicaragua by writing the "Heliconia in Nicaragua".

The format of this paper is similar to "Cassia in Nicaragua" by Mr. Seymour. It consists of an introduction, generic description, artificial key to the species of Heliconia in Nicaragua, an annotated systematic list. Since there are a new species and two new varieties whose ranges include Nicaragua, a section on new names and combinations follows the annotated systematic list.

The genus Heliconia is included in the family Musaceae. It is characterized in the following manner: perennial, herbaceous, erect plants of various heights (1-5 m., occasionally taller); musoid or cannoïd habit. Leaves frequently large, distichous or appear as such. Inflorescence terminal, erect or pendulous, consisting of few to many, usually bright colored, boat-shaped branch-bracts, either distichous or spirally arranged. Branch-bracts enclose clusters of flowers. Each flower subtended by a floral-bract. Flowers perfect. Perianth consists of two whorls; calyx with connate abaxial sepals, free adaxial sepals; corolla with connate petals except for free margins opposite adaxial sepal. Stamens 6, 5 functional and one staminode. Anthers linear. Stigma lobed, clavate or subclavate. Style filiform, straight or geniculate. Ovary inferior; fruit 3-loculed, berry-like (fleshy schizocarp). Seed stony.

ARTIFICIAL KEY TO THE SPECIES

- A. Branch-bracts overlapping forming close-knit spike, rachis covered..... B
B. Inflorescence pendent..... H. mariae
B. Inflorescence erect..... H. imbricata

- A. Branch-bracts separated (distant on rachis) with rachis showing, or partially overlapping with thick branch-bracts 12-18 cm. long C
- C. Mature inflorescence pendent..... D
 D. Branch-bracts spiralled..... H. collinsiana
 D. Branch-bracts distichous..... H. longa
- C. Mature inflorescence erect..... E
- E. Inflorescence sessile or subsessile, branch-bracts thick, deep boat-shaped, may be partially overlapping with rachis diameter 1 cm. or more..... H. wagneriana
- E. Inflorescence usually peduncled, branch-bracts not thick, moderate to shallow boat-shaped with rachis diameter less than 1 cm. thick..... F
- F. Plants with cannoid habit; leaves sessile or nearly so; leaf-blade not more than 55 cm. long..... G
 G. Branch-bracts orange, flowers white or cream-white H
 H. Flowers shorter than or as long as branch-bracts; perianth less than 5 cm. long.....
 H. aurantiaca
 H. Flowers longer than branch-bracts; perianth more than 5 cm. long..... H. longiflora
- G. Branch-bracts red, flowers red or yellow..... I
 I. Flowers red, perianth puberulent to hirsute...
 H. hirsuta var. rubiflora
 I. Flowers yellow, often with green apices, perianth glabrous..... H. vaginalis
- F. Plants with musoid habit; leaves petioled; if cannoid habit, lower leaf-blades more than 55 cm. long..... J
 J
- J. Branch-bracts spiralled..... K
 K. Branch-bracts yellow with red apices or yellow-orange; rachis glabrous... H. latispatha
 K. Branch-bracts red; rachis tomentose.....
 H. tortuosa
- J. Branch-bracts distichous..... L
 L. Branch-bracts 12-22, close together, strongly curved upward..... H. librata
 L. Branch-bracts 4-11, widely spaced, extend out horizontally or reflexed..... M
 M. Branch-bracts deep red to orange scarlet, perianth 4.0-4.5 cm. long, slightly pubescent; petioles short..... H. osaensis
 M. Branch-bracts yellow to orange, perianth 2.5-3 cm. long, villous; petioles long....
 H. schiedeana var. spissa

ANNOTATED SYSTEMATIC LIST

1. H. aurantiaca Ghiesbr. in Lemaire's L'Illustr. Hort. Pl. 332. 1862. Synonyms: Bihai aurantiaca (Ghiesbr.) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. H. brevispatha Hook. in Curtis's Bot. Mag. t. 5416. 1864. H. choconiana S. Wats. in Proc. Amer. Acad. 23: 284. 1888. Bihai choconiana (S. Wats.) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. H. crassa Griggs, Bull. Torr. Bot. Club 30: 646. 1903. Bihai crassa (Griggs) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. Range: s. Mexico to Costa Rica. NICARAGUA: DEPT. ZELAYA: Comarca del Cabo, San Mateo (circa de Rio Wawa), A. Molina 15065 (F); El Recreo, L. E. Long 54 (F).
2. H. collinsiana Griggs, Bull. Torr. Bot. Club 30: 648. 1903. Synonym: Bihai collinsiana (Griggs) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. Range: s. Mexico to Costa Rica. NICARAGUA: DEPT. MANAGUA: between El Curcero and house of Finca Santa Julia, P. C. Standley 8380 (F).
3. H. hirsuta L. f. var. rubiflora R. R. Smith var. nov. See section on treatment of new names and combinations.
4. H. imbricata (O. Ktze.) Baker, Ann. Bot. 7: 191. 1893. Synonym: Bihai imbricata O. Ktze., Rev. Gen. Pl. 2: 684. 1891. Range: Nicaragua to Panama. NICARAGUA: DEPT. ZELAYA: Comarca del Cabo, Miguel Bikon, S. B. Robbins 5863a (MO, SEY).
5. H. latispatha Benth., Voy. Sulph. 170-171. 1844. Synonyms: Bihai latispatha (Benth.) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. H. meridensis Kl. in Linnaea 20: 463. 1847. Bihai meridensis (Kl.) O. Ktze., Rev. Gen. Pl. 2: 685. 1891. Range: s. Mexico to n. S.A. NICARAGUA: DEPT. CHINANDEGA: Chinandega, C. F. Baker 2016 (GH, MO, UC, US); Ameya, W. R. Maxon, A. D. Harvey, and A. T. Valentine 7188 (US). DEPT. GRANADA: Mombacho Volcano, L. O. Williams and A. Molina 20027 (F). DEPT. MANAGUA: Managua, Garnier 862 (MICH, US); Los Nubes, s. of Managua, W. R. Maxon, A. D. Harvey and A. T. Valentine 7500 (US); Tipitapa, F. C. Seymour and J. T. Atwood 2827 (BM, ENAG, F, GH, MICH, MO, NY, SEY, SMU, UC, WDP). DEPT. RIVAS: Penas Blancas, J. T. Atwood 1809 (BM, ENAG, F, GH, NO, NY, SEY, SMU, UC, WDP). DEPT. ZELAYA: El Recreo, R. B. Hamblett 328 (GH, SEY); Rama, S. A. Marshall and D. A. Neill 6460 (SEY); Comarca del Cabo, San Mateo, A. Molina 15096 (F); Corn Island, F. C. Seymour and J. T. Atwood 4266 (BM, ENAG, GH, SMU).
6. H. librata Griggs, Bull. Torr. Bot. Club 30: 649. 1903. Synonym: Bihai librata (Griggs) Griggs, Bull. Torr. Bot. Club 31. 1904.

Range: s. Mexico to Nicaragua.

NICARAGUA: DEPT. ZELAYA: Comarca del Cabo, Slima Sia, A. Molina 1470 (F); Comarca del Cabo, Miguel Bikon, S. B. Robbins 5863 (SEY).

7. H. longa (Griggs) Winkl. in Eng. and Prantl. Nat. Pflanzenf. 2 Aufl. 15A: 536. 1930. Synonym: Bihai longa Griggs, Bull. Torr. Bot. Club 31: 446. 1904. Range: Nicaragua to Panama.
NICARAGUA: DEPT. ZELAYA: 5 mi. w. of Bonanza, J. T. Atwood and D. A. Neill 6995 (MO, SEY); El Recreo, P. C. Standley 19407 (F).
8. H. longiflora R. R. Smith sp. nov.
See section on treatment of new names and combinations.
9. H. mariae Hook. f., Jour. Linn. Soc. Bot. 7: 68-69. 1864.
Synonyms: Bihai mariae (Hook. f.) O. Ktze., Rev. Gen. Pl. 2: 684. 1891. H. elegans Peters. in Mart. Fl. Bras. 33: 12. 1890. Bihai elegans (Peters.) O. Ktze., Rev. Gen. Pl. 2: 684. 1891. H. punicea (Griggs) L. B. Smith, Contr. Gray Herb. 124: 6. 1939. Bihai punicea Griggs, Bull. Torr. Bot. Club 42: 321. 1915.
Range: Guatemala and Belize to S. A.
NICARAGUA: To date there are no recorded specimens of this species for Nicaragua. The range of the species indicates it should be present.
10. H. osaensis Cuf., Archivio Bot. 9: 189. 1933. Range: Nicaragua to Panama.
NICARAGUA: DEPT. ZELAYA: San Antonio de Susun, region of Braggman's Bluff, F. C. Englesing 138 (F, US); El Recreo, L. E. Long 45 (F); Area Del Ocotal, Rio Grande, A. Molina 2332 (F, GH); El Recreo, P. C. Standley 19363 (F).
11. H. schiedeana Kl. var. spissa (Griggs) R. R. Smith var. nov.
See section on treatment of new names and combinations.
12. H. tortuosa Griggs, Bull. Torr. Bot. Club 30: 650. 1903.
Synonym: Bihai tortuosa (Griggs) Griggs, Bull. Torr. Bot. Club 31: 445. 1904. Range: Guatemala to Costa Rica.
NICARAGUA: DEPT. JINOTEGA: Las Mercedes, e. of Jinotega, P. C. Standley 10724 (F). DEPT. MADRIZ: Volcan Somoto, s. of Somoto, L. O. Williams and A. Molina 20274 (F). DEPT. MATAGALPA: along road to La Fundadora, L. O. Williams, A. Molina and T. P. Williams 24827 (F).
13. H. vaginalis Benth., Bot. Voy. Sulph. 171. 1844. Range: s. Mexico to n. S. A.
NICARAGUA: DEPT. MATAGALPA: about 6-10 km. n. e. of Matagalpa, L. O. Williams, A. Molina and T. P. Williams 23823 (F).

DEPT. ZELAYA: Braggman's Bluff, F. C. Englesing 254 (F, US); El Recreo, L. E. Long 65 (F); Montana Esquipulas, P. J. Shank and A. Molina 4728 (F); Comarca del Cabo, Miguel Bikon, B. W. Taylor 4554 (F).

14. H. wagneriana O. G. Peters. in Mart. Fl. Bras. 3 pt. 3: 12. 1890. Synonyms: Bihai wagneriana (Peters.) O. Ktze., Rev. Gen. Pl. 2: 685. 1891. H. elongata Griggs. Bull. Torr. Bot. Club 30: 653. 1903. Bihai elongata (Griggs) Griggs, Bull. Torr. Bot. Club 31: 445. 1904.
NICARAGUA: DEPT. ZELAYA: Comarca del Cabo, San Mateo, cerca de Rio Wawa, A. Molina 15077 (F).

TREATMENT OF NEW NAMES AND COMBINATIONS

The following new names and combinations are those belonging to Central American species of Heliconia. The new taxa discussed here are H. longiflora, H. hirsuta var. rubiflora and H. schiedeana var. spissa. Their ranges include Nicaragua. A brief treatment of the species H. schiedeana and H. hirsuta, are included with the discussion of each variety.

Heliconia longiflora R. R. Smith, sp. nov.

Planta cannoidis, 2-5 m. alta. Lamina lanceolato-elliptica, 17-29 cm. longa, 5-7 cm. lata; apice acuminata. basi obtusa. utriusque viridis. Inflorescentia erecta, 10-15 cm. longa, glabra, breviter pedunculata, rhachi leviter flexuoso. Bractae 4-9, aurantiacae, glabrae, lanceolatae, non profunde cymbiformes, 4.5-9 cm. longae. Bractae internae florales 4 cm. longae, deciduae, lanceolatae, membranaceae, glabrae. Flores in bractearum axillis 3-8, albi ad cremei, 1-1.5 cm. longe pedicellati; perianthium 5.5-6.0 cm longum, glabrum. Fructus caeruleus, ca. 1 cm. diametro.

Slender plants 2-5 m. tall, cannoid habit. Leaf-blade lanceolate-elliptic, 17-29 cm. long, 5-7 cm. wide, long acuminate apex, obtuse base; upper and lower surfaces green; petiole nearly absent or leaf-blade sessile. Inflorescence erect, 10-15 cm. long, glabrous; peduncle short, if present 0.3 cm. diameter; rachis slightly flexuose, 0.2 cm. diameter. Branch-bracts 4-9, orange, glabrous, lanceolate, shallow boat-shaped; lower branch-bracts 9 cm. long; upper branch-bracts 4.5-7.0 cm. long; all branch-bracts 0.6 cm. side width; internode between branch-bracts ca. 1 cm. Floral-bracts few, deciduous, lanceolate, membranous, 4 cm. long, ca. 0.5 cm. wide, glabrous. Flowers 3-8, white to cream, glabrous, 7 cm. long; perianth 5.5-6.0 cm. long; pedicel 1.0-1.5 cm. long. Fruit blue, subglobose to 3-sided, 0.8-1.0 cm. diameter. Seeds not seen.

Type: PANAMA. PROV. COLON: vicinity of Camp Pina, alt. 25 m., 11 July 1946, P. H. Allen 3590 (Holotype: US; Isotypes F, NY, UC) (Fig. 1).

Distribution: Edge of moist forest and along river margins, low altitudes. It appears to be restricted to Central America in the countries of Nicaragua, Costa Rica and Panama.

This species was previously included with H. aurantiaca, since it also possesses the orange branch-bracts. The flowers in H. aurantiaca are cream to yellow colored. In H. longiflora the flowers are white, and then change to cream color when they mature. The flowers of H. longiflora are nearly 2 cm. longer than those of H. aurantiaca. As noted in the key, H. aurantiaca possesses flowers which are normally shorter than or as long as the bracts. The flowers of H. longiflora are normally longer than the bracts.

Representative Specimens:

COSTA RICA: PROV. ALAJUELA: lowland rain forest between Los Chiles and Venecia, Llanura de San Carlos, alt. 100 m., 20 Feb. 1966, A. Molina R., L. O. Williams, W. Burger, B. Wallenta 17574 (F). PROV. PUNTARENAS: edge of forest between Golfo Dulce and Rio Terraba, alt. 30 m., Dec. 1947, A. F. Skutch 5397 (US); in forest, basin of El General, alt. 675-900 m., March 1940, A. F. Skutch 4761 (GH, NY).

NICARAGUA: DEPT. ZELAYA: open bush, vicinity of El Recreo, 12 Aug. 1947, L. E. Long 59 (F).

PANAMA: CANAL ZONE: n.w. part of Canal Zone, area w. of Limon Bay, Gatun Locks and Gatun Lake, 8 Nov. 1955, I. M. Johnston 1625 (GH); forests around Puerto Obaldia, San Blas coast, alt. 0-50 m., Aug. 1911, H. Pittier 4285 (GH). PROV. COCLE: La Mesa, 31 Aug. 1941, P. H. Allen 2692 (GH, MO). PROV. COLON: vicinity of Camp Pina, alt. 25 m., 11 July 1946, P. H. Allen 3590 (F). PROV. DARIEN: Rio Chico across from Boca de Tesca along the top of a ridge, 18 July 1962, J. A. Duke 5209 (MO); ascent of Cerro Pirre from Rio Pirre s. of El Real, 600-750 m., 11 Aug. 1962, J. A. Duke 5304 (MO); along Pam Am Highway between Pucro and Rio Punusa, 3 Aug. 1962, J. A. Duke 5303 (MO) Cana-Cuasi Trail (Camp 2) Chepigana district, alt. 2000 ft., 9 March 1940, M. E. Terry and R. A. Terry 1423 (F). PROV. PANAMA: ca. 7 mi. n. Cerro Azu on road to Cerro Jefe, elev. ca. 2600 ft., 13 Nov. 1965, K. E. Blum, R. K. Godfrey, and E. Tyson 1843 (FSU); on trail to Cerro Campana, 23 Aug. 1967, J. H. Kirkbride, Jr. and Sister Hayden 297 (MO).

Heliconia hirsuta L. f., Suppl. Syst. Veg. 158. 1781. Synonyms: Bihai hirsuta (L. f.) O. Ktze., Rev. Gen. Pl. 2:684. 1891. H. straminea (Griggs) Standley, Jour. Wash. Acad. Sci. 17:162. 1927.

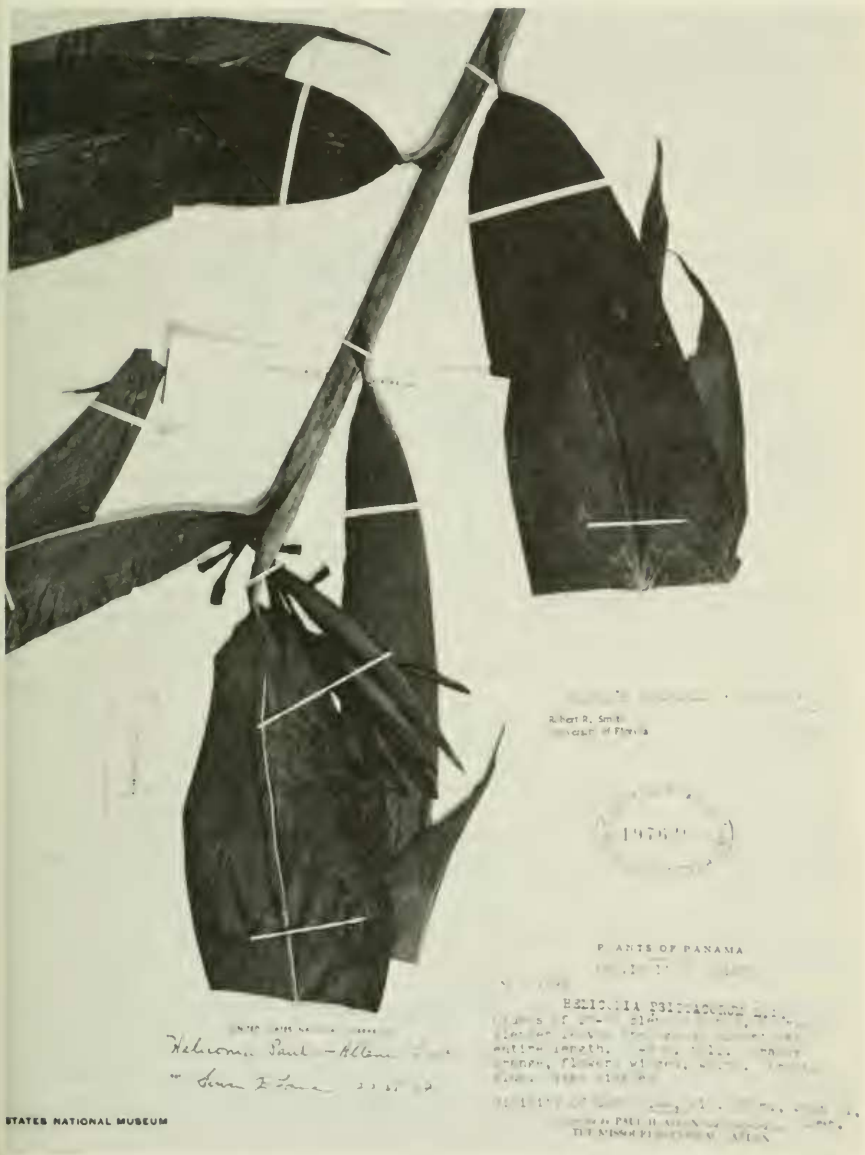


Fig. 1. Holotype of H. longiflora (US).

Bihai straminea Griggs, Bull. Torr. Bot. Club 42:327. 1915.

Slender plant, 1-3 m. tall; cannoid habit. Inflorescence erect, nearly glabrous to pubescent, 6-9 cm. long. Branch-bracts 4-9, dark, brick-red or straw-yellow with greenish tinge, shallow boat-shaped. Floral-bracts deciduous, ca. 1.5-1.8 cm. long. Flowers 4-12 per branch-bract, yellow with green apices or completely red, ca. 3.5-4.5 cm. long; perianth 2.2-3.0 cm. long; pedicel 0.4-1.8 cm. long, slightly pubescent to hirsute.

Distribution: Moist thickets and woods, along banks of rivers and edges of forest swamps. Heliconia hirsuta is common in the northern part of South America, and extends up into Panama. The variety is found farther north in the Central American countries of Belize and Nicaragua.

Heliconia hirsuta is not easily confused with other species of Heliconia, since it is of smaller stature and possesses hirsute inflorescences. Heliconia hirsuta var. hirsuta has a very pubescent perianth, and the var. rubiflora possesses a slightly to moderately pubescent perianth. The two varieties are similar in habit, and in occupying similar habitats.

Key to Varieties of Heliconia hirsuta

Plant 1-3 m. tall; perianth yellow with green tip, hirsute.....
var. hirsuta

Plant ca. 1 m. tall, perianth brick-red; slightly to moderately hirsute.....
var. rubiflora

Heliconia hirsuta L. f. var. hirsuta

Branch-bracts 5-9, red to yellow, lower branch-bracts 9-11 cm. long. Upper branch-bracts 3-4 cm. long. Flowers 4-10 per branch-bract, pale yellow with greenish tips, hirsute, 3.5-4.5 cm. long; perianth 2.5-2.8 cm. long, hirsute; pedicel 1.0-1.8 cm. long, hirsute-tomentose.

Distribution: Extends throughout northern South America into Panama.

Heliconia hirsuta L. f. var. rubiflora R. R. Smith var. nov.

Planta ca. 1 m. alta. Lamina 15-25 cm. longa, 5-6 cm. lata. Bracteae 4-5, rubrae; bracteae infernae 6-11 cm. longae. Flores in bractearum axillis 4-8, rubri; perianthium 2.5-3.0 cm. longum, puberulum ad sparse hirsutum.

Plant ca. 1 m. tall. Leaf-blades 15-25 cm. long, 5-6 cm. wide. Branch-bracts 4-5, red; lowest branch-bracts 6-11 cm. long, uppermost branch-bracts 2.5-4.0 cm. long; all branch-bracts 0.4-0.7 cm. side width. Flowers 4-8 per branch-bract, red, 3.5-4.0 cm. long; perianth 2.5-3.0 cm. long, puberulent to slightly hirsute with short whitish hairs.

Type: BELIZE. DIST. STANN CREEK: swamp places, Stann Creek, alt. 20 ft., 19 Sept. 1967, W. A. Schipp 357 (Holotype: MO; Isotypes F, MICH, NY, UC).

Distribution: Has been found in only two Central American countries, Belize and Nicaragua.

Representative Specimens:

BELIZE: DIST. STANN CREEK: growing in open flats, Stann Creek, 6 Dec. 1931, W. A. Schipp 835 (F, MICH, MO, NY, UC).

NICARAGUA: DEPT. ZELAYA: Comarca del Cabo, Francis Sirpi, between Waspan and Puerto Cabezas, elev. 0-100 m., 15 Mar. 1971, J. T. Atwood 4793 (MO, SEY); near Esperanza, Rio Grande, alt. 0-15 m., 10 April 1949, A. Molina R. 2127 (F); Comarca del Cabo, rain forest, Miguel Bikon, 13 July 1972, S. B. Robbins 5863 b (MO, SEY); Comarca del Cabo, Cororia Bush, 40-45 km. s.w. of Waspan, rain forest, elev. 10-100 m., 21 Jan. 1970, F. C. Seymour and J. T. Atwood 3725 (GH, MO, SEY); Comarca del Cabo, swamp near Bilwaskarma, elev. 0-100 m., 14 Mar. 1971, F. C. Seymour 4702 (SEY).

Heliconia schiedeana K., Linnaea 20:463. 1847. Synonyms: Bihai schiedeana (Kl.) O. Ktze., Rev. Gen. Pl. 2:685. 1891. H. hirsuta Cham. and Schlect. in Linnaea 6:57. 1831. (non H. hirsuta L. f.). H. pochutlensis Conzatti, Fl. Tanon Mex. 3:129. 1947.

Moderately stout plant, 1.5-3.0 m. tall, musoid habit. Inflorescence erect, pubescent, 25-30 cm. long. peduncled; rachis slightly flexuose to straight, densely tomentose pubescent, spiralled. Branch-bracts 6-12, dark-red, red-green yellow to orange, shallow boat-shaped, may become strongly reflexed while maturing. Floral-bracts 4-8, long ovate to wide lanceolate, 3-4 cm. long, 0.5-1.0 cm. wide, often pubescent on outer surface. Flowers 6-21 per branch-bract, yellow densely villous; perianth 2.5-5.0 cm. long, villous; pedicel 1.0-1.5 cm. long, villous-pilose. Fruit dark, subglobose to 3-sided, villous, ca. 1 cm. diameter.

Heliconia schiedeana is not closely related to other species

of Heliconia. The outstanding characteristics of the species are the pubescence of the inflorescence and the showy floral-bracts extending out over the long thin branch-bracts. The fruits are exposed on long, hairy pedicels, and not hidden within the branch-bracts.

Key to the varieties of H. schiedeana

Branch-bracts red or red-green; perianth 3.5-5.0 cm. long.....
var. schiedeana

Branch-bracts yellow or yellow-green; perianth 2.5-3.0 cm. long..
var. spissa

Heliconia schiedeana Kl. var. schiedeana

Inflorescence erect, pubescent, 15-45 cm. long, rachis slightly to moderately flexuose. Branch-bracts 6-15, dull-red to red-green. Flowers 6-21, pale yellow 3.0-6.5 cm. long; perianth villous.

Distribution: Steep, moist slopes of ravines and mountains. Endemic to Mexico.

Heliconia schiedeana Kl. var. spissa (Griggs) R. R. Smith, var nov.

Synonyms: Heliconia spissa Griggs, Bull. Torr. Bot. Club 30: 652. 1903. Bihai spissa (Griggs) Griggs, Bull. Torr. Bot. Club 31: 445. 1904.

Lamina oblongo-ovata, 60-75 cm. longa, 20 cm. lata, apice acuta, basi roundata; petiolus longus. Inflorescentia erecta, 15-35 cm. longa, pubescenti. Bractae 9-12, luteae ad aurantiacae. Flores in bractearum axillis 10-17, lutei, 4 cm. longi; perianthium 2.5-3.0 cm. longum, villosum.

Leaf-blade oblong-ovate, 60-75 cm. long, 20 cm. wide acute apex, rounded base; petiole long. Inflorescence erect, pubescent, 15-35 cm. long; rachis red, nearly straight. Branch-bracts 9-12, bright yellow to orange; middle branch-bracts 5-7 cm. long. Flowers 10-17 per branch-bract, yellow, 4 cm. long; perianth 2.5-3.0 cm. long, villous. Fruit dark-yellowish color, subglobose to 3-sided, 1 cm. diameter; seed 0.8 cm. long, 0.7 cm. wide; seedcoat sclerified, rough somewhat wrinkled.

Type: GUATEMALA: DEPT. ALTA VERAPAZ: near finca Sepacuite, 30 March 1902, O. F. Cook and R. R. Griggs 359 (US).

Distribution: Rain forest, thickets near river. s. Mexico to Nicaragua.

Representative Specimens:

BELIZE: DIST. BELIZE: in high forest, churchyard on Sibun River, Jan.-June 1936, C. L. Lundell 6950 (MICH, NY). DIST. EL CAYO: between El Cayo and Benque Viejo, 15 Feb. 1931, H. H. Bartlett 11511 (MICH).

GUATEMALA: DEPT. VERAPAZ: thicket along river Pantin, below Tamahu, alt. ca. 600 m., 5 April 1939, P. C. Standley 70571 (F); damp forested slopes, along road between San Crestobal Verapaz and Chexoy, alt. 1200-1300 m., 19 Feb. 1942, J. A. Steyermark 43899 (F). DEPT. PETEN: Tikal, 12-15 April 1931, H. H. Bartlett 12638 (GH, MICH); Santa Teresa, Subin River, 13 April 1933, C. L. Lundell 2890 (F, GH, MICH); Cerro Ceibal, alt. 75-150 m., 30 April 1942, J. A. Steyermark 46089 (F).

HONDURAS: DEPT. COMAYAGUA: Quebrada Montanuelas, alt. 1400 m., 18 July 1962, A. Molina R. 10873 (F); Palm Grove, San Louis, alt. 2500 ft., 5 May 1933, J. B. Edwards 598 (F, GH). DEPT. EL PARISO: Montana Cifuentes, 15 March 1963, A. Molina R. 11404 (F).

MEXICO: STATE CHIAPAS: near Laguna Ocotol Grande, elev. ca. 950 m., 20 July - 20 Aug. 1954, R. L. Dressler 1584 (GH).

NICARAGUA: DEPT. NEUVA SEGOVIA: vicinity of Jalapa, 23 Dec. 1973, J. T. Atwood, S. A. Marshall, and D. A. Neill 6773 (SEY).

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LITERATURE CITED

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